What is claimed is:

1. A method for separating ferrate salts from a solution, comprising:
providing contact between the solution and a surface having a magnetic attraction;
magnetically securing the ferrate salts to the surface; and
eliminating contact between the solution and the surface.

2. The method of claim 1, wherein the step of providing contact is selected from immersing the surface in the solution, passing the liquid ferrate mixture over the surface, and combinations thereof.

3. The method of claim 1, wherein the solution consists essentially of aqueous hydroxide and the ferrate salts.

4. The method of claim 1, wherein the solution consists essentially of one or more aqueous hydroxides, one or more alcohols and a ferrate salt.

5. The method of claim 1, wherein the magnetic attraction is induced by one or more magnets selected from permanent magnets, electromagnets, and combinations thereof.

6. The method of claim 5, wherein the surface is a non-magnetic material covering the magnets.

7. The method of claim 1, wherein the surface is constructed of the one or more permanent magnets, one or more electromagnets, or combinations thereof.

8. The method of claim 1, wherein the step of eliminating contact comprises:
withdrawing the surface out of the solution with the ferrate salts secured to the surface.

9. The method of claim 8, wherein the surface is the surface of a shape selected from a drum, a cylinder, a chain, a belt, a plate and a sphere.

10. The method of claim 8, further comprising:

after withdrawing the surface out of the solution, washing the ferrate salts secured to the surface with alcohol.

11. The method of claim 10, wherein the alcohol is selected from methanol, ethanol, isopropanol, and combinations thereof.

12. The method of claim 8, wherein the solution is contained within a reservoir, a tank, an electrochemical cell chamber, a pipe or a pool.

13. The method of claim 1, wherein the step of providing contact includes passing the solution over the surface in a contact area by contact means selected from spraying, pumping, dumping, misting, and pouring, and wherein the step of eliminating contact includes moving the surface out of the contact area.

14. The method of claim 13, further comprising:

moving the surface though an alcohol wash area; and

spraying an alcohol onto the ferrate particles secured to the surface.

15. The method of claim 14, wherein the alcohol is selected from methanol, ethanol, isopropanol, and combinations thereof.

16. The method of claim 13, wherein the surface is selected from a plate, a belt, or a chain.

17. The method of claim 1, further comprising:

removing the ferrate salts from the surface.

18. The method of claim 17, wherein the magnetic attraction is induced by electromagnets, and wherein the step of removing the ferrate salts from the surface further comprises:

turning off the electromagnets.

19. The method of claim 18, further comprising:

scraping the ferrate salts off the surface.

20. The method of claim 17, wherein the magnetic attraction is induced by permanent magnets, and wherein the step of removing the ferrate salts from the surface further comprises:

scraping the particles off the surface.

21. The method of claim 1, further comprising:

centrifuging the solution to obtain a concentrate solution having an increased ferrate salt concentration;

removing the concentrate solution from the centrifuge; and

mixing the concentrate solution with an alcohol before the step of providing contact between the solution and the surface.

22. The method of claim 21, wherein the alcohol is selected from methanol, ethanol, isopropanol, and combinations thereof.

23. A ferrate salt produced in accordance with the method of claim 1.

24. An apparatus for electrochemical production of a ferrate salt, comprising:

an electrochemical cell having an iron-containing anode, cathode, and an aqueous hydroxide solution in fluid communication with both the anode and the cathode; and

a magnetic separator in fluid communication with the aqueous hydroxide solution for separating ferrate salts from the aqueous hydroxide solution.

25. The apparatus of claim 24, wherein the aqueous hydroxide solution comprises a hydroxide selected from sodium hydroxide, potassium hydroxide, lithium hydroxide, cesium hydroxide, barium hydroxides, and combinations thereof.

26. The apparatus of claim 24, wherein the aqueous hydroxide solution comprises a hydroxide selected from alkali earth metal hydroxides, alkaline earth metal hydroxides and combinations thereof.

27. The apparatus of claim 24, wherein the aqueous hydroxide solution has a hydroxide concentration between about 1 molar and about 30 molar.

28. The apparatus of claim 24, wherein the aqueous hydroxide solution has a hydroxide concentration of between about 5 molar and 20 molar.

29. The apparatus of claim 24, wherein the aqueous hydroxide solution has a hydroxide concentration of between about 10 molar and about 20 molar.

30. The apparatus of claim 24, wherein the aqueous hydroxide solution comprises a mixture of sodium hydroxide and potassium hydroxide.

31. The apparatus of claim 30, wherein the mixture has a molar ratio of potassium hydroxide to sodium hydroxide between about 1 and about 3.

32. The apparatus of claim 30, wherein the mixture has a molar ratio of potassium hydroxide to sodium hydroxide up to about 5.

33. The apparatus of claim 30, wherein the aqueous hydroxide solution comprises between about 5 molar and about 15 molar NaOH and between about 5 molar and about 15 molar KOH.

34. The apparatus of claim 24, wherein the anode has an iron content of between 90% and 100%.

35. The apparatus of claim 24, wherein the anode has an iron content greater than about 99%.

36. The apparatus of claim 24, wherein the anode is made of material selected from iron, cast irons, malleable iron, ductile iron, carbon steels, stainless steels and combinations thereof

37. The apparatus of claim 24, wherein the anode has a configuration selected from expanded metal mesh, wire mesh, woven metal cloth, flat plate, rod and combinations thereof.

38. The apparatus of claim 24, wherein the cathode is made of material selected from iron, iron alloys, nickel, nickel alloys, and carbon.

39. The apparatus of claim 24, wherein the cathode is made of material selected from iron, cast irons, malleable iron, ductile iron, carbon steels, stainless steels and combinations thereof.

40. The apparatus of claim 24, wherein the cathode is made of material selected from nickel, nickel-molybdenum alloys, nickel-vanadium alloys and combinations thereof.

41. The apparatus claim 24, wherein the cathode has a configuration selected from expanded metal mesh, wire mesh, woven metal cloth, flat plate, rod and combinations thereof.

42. The apparatus of claim 24, wherein the anode is shaped in a form selected from arcuate or cylindrical, and wherein the cathode is positioned along an axis of the anode.

43. The apparatus of claim 24, further comprising a porous frit, wherein the frit is placed between the cathode and anode.